REMARKS

This is in response to the Office Action dated July 9, 2003. Claim 4 has been canceled without prejudice. Claims 14-16 and 21-27 have also been canceled, without prejudice in view of the Restriction Requirement. New claims 28-36 have been added. Thus, claims 1-3, 5-13, 17-20 and 28-36 are now pending.

General

For purposes of example and without limitation, certain example embodiments of this invention relate to a retroreflector to be used in a liquid crystal display (LCD), or in any other suitable application. A retroreflector reflects incoming light back along a path parallel to that of the incoming light ray, even when the incoming light ray path is not normal to the general surface of the retroreflector. There are multiple types of retroreflectors, including (a) cubic corner cube type retroreflectors, and (b) triangular pyramidal corner type retroreflectors. Triangular pyramidal corner type retroreflectors are problematic in that they are not particularly efficient; i.e., incoming light cannot be efficiently reflected in the desired direction as shown in Figs. 3A-3B of the instant application (e.g., see also paragraphs [0015] - [0018]). Cubic corner cube type retroreflectors are much more efficient retroreflectors than are triangular pyramidial corner type retroreflectors, as shown in Figs. 3C-3D of the instant application (see also paragraphs [0019] and [0087]).

Unfortunately, the more efficient cubic corner type retroreflectors have conventionally been very difficult to manufacture at sizes needed in small applications

(e.g., paragraph [0019]). Thus, it has been very hard to use this type of retroreflector in applications such as LCDs where very small size is desired.

Certain example embodiments of this invention overcome these problems by providing a cubic corner type retroreflector that is capable of being manufactured in an improved manner. In particular, according to certain example embodiments of this invention, such a cubic corner type retroreflector is made up of multiple pieces which oppose one another. By using the multiple different pieces which oppose one another, it is possible to manufacture cubic corner cube retroreflectors in a more efficient manner for small scale applications.

Claim 1

Claim 1 stands rejected under 35 U.S.C. Section 102(b) as being allegedly anticipated by Jones (US 5,182,663). This Section 102(b) rejection is respectfully traversed for at least the following reasons.

Claim 1 requires that "the optical element comprises a plurality of cubic corner cubes, each of which comprises a first set of triangular planes defined by the first concave portion and a second set of triangular planes defined by the second concave portion so as to provide each cubic corner cube with substantially square reflective planes opposed substantially perpendicular to one another." The instant specification explains that a "cubic corner cube" is defined as a structure with three substantially square reflective planes S1, S2 and S3 that are opposed substantially (or almost) perpendicular to one another (e.g., see Figs. 2A-2C and 3C-3D; and paragraphs [0009]-[0010]). It can be seen

in Fig. 5 that the triangular planes from the respective first and second members when combined together all the substantially square reflective planes of the claimed cubic corner cubes to be formed. The instant specification explains that such a structure is much more efficient and advantageous compared to conventional triangular pyramidial corner cube type retroreflectors (e.g., Figs. 3A-3D; and paragraph [0087]). The cited art fails to disclose or suggest the cubic corner cube aspect of claim 1.

Jones discloses a retroreflector. However, each of members 30d and 30d' in Jones is a triangular pyramidial corner cube array and consists of three orthogonal reflective triangular faces (i.e., a set of triangular planes) as shown in Figs. 1a and 1b. In Jones, members 30d and 30d' are arranged in parallel and do not constitute a cubic corner cube array. Thus, it can be seen that Jones fails to disclose or suggest the claimed ***cubic*** corner cube aspect of claim 1. In fact, Jones teaches directly away from the invention of claim 1 by using triangular pyramidal corner type retroreflectors which are shown to be undesirable and inefficient in the instant specification.

Claim 17

Claim 17 requires "disposing the first and second members in such a manner that the first and second members extend along a common plane, that the first surface of the first member is opposed to the second surface of the second member and that the first and second reflective regions ***do not overlap*** each other as viewed in a normal direction to the common plane." E.g., see pg. 28, paragraph [0084]. As shown in Figs. 5A-5F of the instant application for example, the reflecting regions of members 50a and 50b are

alternately arranged to form a reflecting region of retroreflector 50 and, therefore, do not overlap each other as viewed in a direction normal to the common plane.

In contrast, Fig. 3 of Jones shows that the reflecting regions of members 30d and 30d' must overlap one another so that light passing through one member without being reflected can be retroreflected by the other member (col. 4, lines 35-43). Accordingly, Jones fails to disclose or suggest that "the first and second reflective regions *do not overlap* each other as viewed in a normal direction to the common plane" as required by claim 17. Instead, Jones teaches overlap, which is the opposite of what claim 17 requires (i.e., Jones teaches directly away from the invention of claim 17). Thus, Jones cannot possibly anticipate or otherwise render claim 17 unpatentable.

Claim 18

Claim 18 requires that "the corner cube array is made up of a plurality of ***cubic*** corner cubes." As explained above, the instant specification explains that a "cubic corner cube" is defined as a structure with three substantially *square* reflective planes S1, S2 and S3 that are opposed substantially (or almost) perpendicular to one another (e.g., see Figs. 3C-3D; and paragraphs [0009]-[0010]). Again, Jones fails to disclose or suggest this aspect of claim 18.

Claims 30 & 34

Claims 30 and 34 require that each of the cubic corner cubes has three substantially square planes that are opposed substantially perpendicularly to each other, and each of the square planes is defined by one of the triangular facets of the first

concave portion and one of the triangular facets of the second concave portion. Again, Jones fails to disclose or suggest this aspect of claims 30 and 34.

Claims 31, 32 & 35

Claims 31, 32 and 35 require a liquid crystal layer provided between the first and second members. Jones fails to disclose or suggest this aspect of these claims. There is absolutely nothing in the art of record which discloses or suggests this aspect of these claims.

Claims 29 & 33

Claims 29 and 33 require non-overlapping reflective regions. Again, Jones fails to disclose or suggest this aspect of these claims. See the discussion above with respect to claim 17.

Conclusion

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. All claims are in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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